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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/682,770	10/17/2001	George Steve Saloka	200-1264 KAV	4212
32997	7590	11/18/2004		
TUNG & ASSOCIATES 838 WEST LONG LAKE, SUITE 120 BLOOMFIELD HILLS, MI 48302			EXAMINER HODGE, ROBERT W	
			ART UNIT 1746	PAPER NUMBER

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/682,770

Applicant(s)

SALOKA ET AL.

Examiner

Robert Hodge

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 8-20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3 is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 4-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks, filed 8/30/2004, with respect to the rejection(s) of claim(s) 1-2, 4 and 7 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Gittleman U.S. Patent No. 6,635,372 hereinafter referred to as Gittleman.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aramaki Pre-Grant Publication No. 2002/0039672 hereinafter referred to as Aramaki in view of Gittleman.

4. Claim 1 is anticipated by Aramaki in the following manner. Both the claim and Aramaki disclose a system comprising: an air compressor (compressor 2); and a conduit system (bypass flow passage 7) which is communicatively coupled to, and receives compressed air from, said air compressor (compressor 2); and which is further communicatively coupled to said fuel cell (fuel cell 1). The claim further discloses that the conduit system is effective to selectively deliver said compressed air directly to said

fuel cell during cold start conditions. The expression "selectively deliver...directly to said fuel cell" is construed as to mean that there are no functional elements acting on the air between the compressor and the fuel cell. By virtue of being compressed, the air would be warmed in an amount proportional to the work done on the air by the compressor. See also paragraphs [0021] and [0043] disclosing the same. The warmed air, upon delivery to the fuel cell, is effective to heat said fuel cell. As to the limitation that the system be used in conjunction with a fuel cell in a vehicle, Aramaki discloses at [0003]: "The start-up motor is used for variably drive the compressor and is specifically suited for use in an automotive field." Aramaki also teaches the use of "a source of fuel" being included in the fuel cell system in paragraph [0024]: "A fuel electrode (i.e., an anode electrode) is supplied with feed fuel gas (i.e., hydrogen gas) from a fuel gas supply unit (not shown)..."

5. As to claim 2, Aramaki and the claim both disclose that the system further includes a heat exchanger (heat exchanger 11) disposed within said conduit system and which is effective to selectively cool said compressed air ("...the heat exchanger 11 serves to lower the temperature of compressed air to a level not to cause the fuel cell 1 to be damaged." [0021]). Claim 2 and Aramaki both disclose a bypass valve (valves 8 and 9) which is operatively disposed within said conduit system and which is effective to selectively cause said compressed air to bypass ("...bypass flow passage 7." [0020]) said heat exchanger (heat exchanger 11) and to be delivered directly to said fuel cell (fuel cell 1) during cold start conditions, effective to heat said fuel cell. ("During the start-up operation at cold temperature, since compressed air is supplied to the fuel cell

bypassing the air treatment units, such as the silencer 10 and the heat exchanger 11, which has a large heat capacity, the temperature of compressed air is immediately raised to a suitable level such that a power generation efficiency of the fuel cell 1 is satisfactorily increased." [0043])

6. As to claim 4 further limiting claim 2 and disclosing that there is at least one sensor ("temperature sensor 23 in an air supply conduit".[0058]) effective to measure at least one vehicle operating attribute. Since the temperature sensor measures the air supply temperature, which is an operating attribute, the claim limitation is met. The sensor generates a signal representing said at least one measured vehicle operating attribute ("The temperature sensor 23 functions to monitor the temperature of compressed air to be supplied to the fuel cell 1 for producing a detection signal, indicative of a temperature T". [0058]); and a controller which is communicatively coupled to said bypass valve and to said at least one sensor, said controller being effective to receive said signal and to selectively control said bypass valve based upon the value of said signal. ("When the temperature T is equal to or exceeds a "flow-passage change-over" temperature threshold value T2 in the controller 20, the controller 20 actuates the first and second change-over valves 8 and 9 such that the bypass flow passage 7 is changed over to the main air-flow passage 6 which allows compressed air, flowing from the compressor 2, to be supplied to the fuel cell 1.")

7. With respect to claim 7, further limiting claim 4 disclosing that the monitored value is the temperature of the compressed gas, the same is disclosed in paragraph [0058]: "Further, in the fourth embodiment, the parameters, by which the "flow-passage

change-over" timings are determined, may further include, in addition to the temperature T of compressed air...and a suitable combination of these parameters."

8. Aramaki does not teach that the "...air from said air compressor and is provided in thermal contact with fuel from said source of fuel" or "to heat said fuel before said fuel is communicated to said fuel cell".

9. Gittleman teaches that air can be used to raise the temperature of a fuel in a heat exchanger that would be in fluid communication with a fuel cell (column 3, lines 58-60).

10. It would have been obvious to modify Aramaki to include heating the fuel with the compressed air in the already existing heat exchanger such as taught by Gittleman in order to evenly heat both sides of the fuel cell simultaneously and bring both gases fed to the fuel cell to an equivalent temperature by putting them in thermal contact with one another.

11. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aramaki and Gittleman in view of Wheat et al. Pre-Grant Publication No. 2003/0049504 hereinafter referred to as Wheat et al.

12. Aramaki and Gittleman disclose the claimed invention in the above 35 U.S.C. 103(a) rejection, except for the temperature sensor sampling the ambient temperature and temperature of the fuel cell. Wheat et al. teaches that it is known to measure the temperature of the fuel cell and the ambient air. See specifically paragraph [0016] "In yet other features of the invention, an ambient temperature sensor generates an ambient temperature signal. Additionally, paragraph [0015] discloses: "A stack

temperature sensor is connected to the controller and generates a stack temperature signal.”

13. It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a fuel cell and ambient air sensor as taught by Wheat et al., since Wheat et al. states at paragraph [0037] “...the fuel cell controller 160 measures internal stack temperature, the ambient temperature...and determines whether heating is necessary. ... prevent damage due to freezing.”

Allowable Subject Matter

14. The following is a statement of reasons for the indication of allowable subject matter:

15. With respect to claim 3, the prior art of record apparently fails to contemplate a system that relies on two heat exchangers, one for the incoming air to preheat the hydrogen and a second to cool the incoming air. The prior art does allow for the suggested inclusion of one or the other as previously stated in the above 35 U.S.C. 103(a) rejection, but not both in the same system. Furthermore the prior art that does disclose the use of two heat exchangers apparently relies on the exhaust stream to preheat the fuel stream.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. U.S. Patent No. 6,521,204 to Borup et al. teaches a fuel cell system with multiple heat exchangers used to heat and cool the reactant gases before being communicated to the fuel cell stack

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Hodge whose telephone number is (571) 272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RWH 11-15-04

MICHAEL BARR
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Michael Barr', with a long horizontal stroke extending to the right.